

SPACE DEBRIS SYMPOSIUM (A6)  
Space Debris Removal Issues (5)Author: Prof. Tetsuo Yasaka  
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## CAN WE HAVE AN END TO THE DEBRIS ISSUE?

**Abstract**

Within roughly 30 years of space debris research, our understanding of the mechanism and actual situation reached a remarkable level. Various countermeasures were proposed and executed for prevention of excessive increase of space debris. However, space utilization will continue to expand, resulting in greater number of hardware launched and orbited around the earth. There are two extreme images of our future space environment. One written in “Home Going” by Frederic Pohl, and the other in “3001, the Final Odyssey” by Arthur Clark. The former describes our Earth completely covered up by junks, after a major world war, resulting in very low survival chance of space vehicles even those of earth escape missions penetrating the junk layer. The latter tells us of the day when all debris and satellites were removed from the earth environment, leaving several Space Elevators sticking out above the equator. Which will be our real future? A vital item to be recognized by everybody, including political and military people, as well as us in the debris community, is that fragmentation is the vital issue which should be avoided, not increment of space assets. Healthy space assts can be managed by technologies existing today and tomorrow. On the other hand, a single fragmentation creates debris whose number could be comparable to that of existing space assets, making the management into demolition. Establishment of a system that ensures fragmentation avoidance should be our final goal. The paper will describe a short term program and possible long term strategies leading to the goal. Respective items to be taken up in short-term are mostly listed up already in past reports published by IAA, UN and IADC. The item to be defined still is how to conduct large object retrieval, and the paper will propose a numerical criteria that would lead to public understanding. As longer term strategy, some sort of orbit regulations should be considered, leading to establishment of those comparable to traffic rules on earth. There are occasional violations of ground traffic rules resulting in tragedies, but establishment of rules and their enforcement ensure a safe and lasting society.